Leibnitz’s Linear Form:

The standard form the equation is

Where, P and Q are either constants or functions of x.

Its solution is given by

Equation reducible to Leibnitz’s Linear Form (or Bernoulli Form).

Dividing by , Putting and solving, we get

This is a linear differential equation of first order in t.

* Solve the following differential equation: .

The above equation can be written as

Comparing with , we get

I.F. = =

Its solution will be

* Solve:

Comparing with , we get

I.F. = =

Its solution will be Which is the required solution.

* Solve:

Divide by Put

I.F. = =

Its solution is

Exact Differential Equations:

The equation Mdx + Ndy = 0 (where M, N are functions of x and y) is said to be exact if the LHS is the exact differential of a function of x and y. i.e. if Mdx + Ndy = du, where u is function of x and y.

The equation Mdx + Ndy = 0 is exact if and then the solution is .

* Solve:

Compare Mdx + Ndy = 0, M = and N = ,

Therefore, the given equation is exact. Its solution is

Which is the required solution.

Equations reducible to the Exact Equations:

Sometimes, we obtain I.F. by inspection. In selecting a suitable integrating factor, we use the following differentials: